Moody Bridge
Garberville Vicinity
Humboldt County
California

HAER No. CA-4

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HistoricAmerican Engineering Record
National Park Service
Department of the Interior
Washington DC

HISTORIC AMERICAN ENGINEERING RECORD

Moody Bridge (4C-28)

Location: Spanning the South Fork Eel River, connecting the south bank and north bank sections of Sprowel Creek Road, 3/4 miles southwest of Garberville, Humboldt County, California. (Figure 1 and 2)

(NW 1/4, Section 25, T4S, R3E, HBM; Quad: U.S.G.S. 15 min. Garverbille, California; Assessor's Parcel No. 213-181-06)

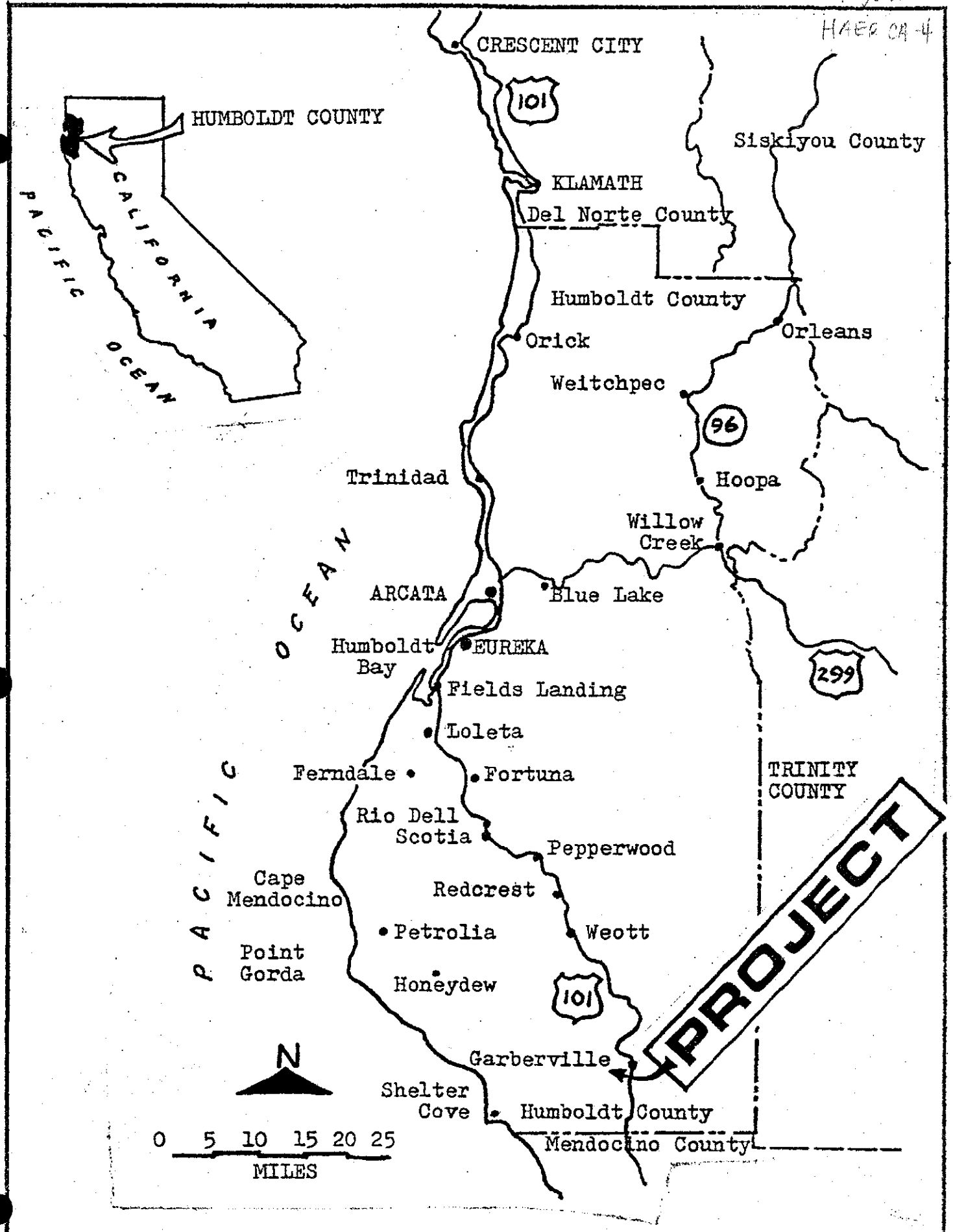
Date of Construction: Original: 1908-1909. Rehabilitation: 1938, 1955, 1960, 1965.

Present Owner: The County of Humboldt
County Courthouse
825 Fifth Street
Eureka, California 95501

Present Use: Vehicular and pedestrian traffic.

Significance: Moody Bridge is one of four remaining Parker, pin-connected through truss steel bridges in California. It embodies the distinctive characteristics of a type, period, and method of construction. The bridge was designed by R.L. Thomas for Humboldt County.

Historian: Susan L. Hope, 1979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PACIFIC OCEAN
Siskiyou County
KLAMATH
Del Norte County
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Orick
Orleans
Weitchpec
96
Trinidad
Hoopa
Willow Creek
ARCATA
Blue Lake
Humboldt Bay
EUREKA
299
Fields Landing
Loleta
Ferndale
Fortuna
TRINITY COUNTY
Rio Dell
Scotia
Pepperwood
Cape Mendocino
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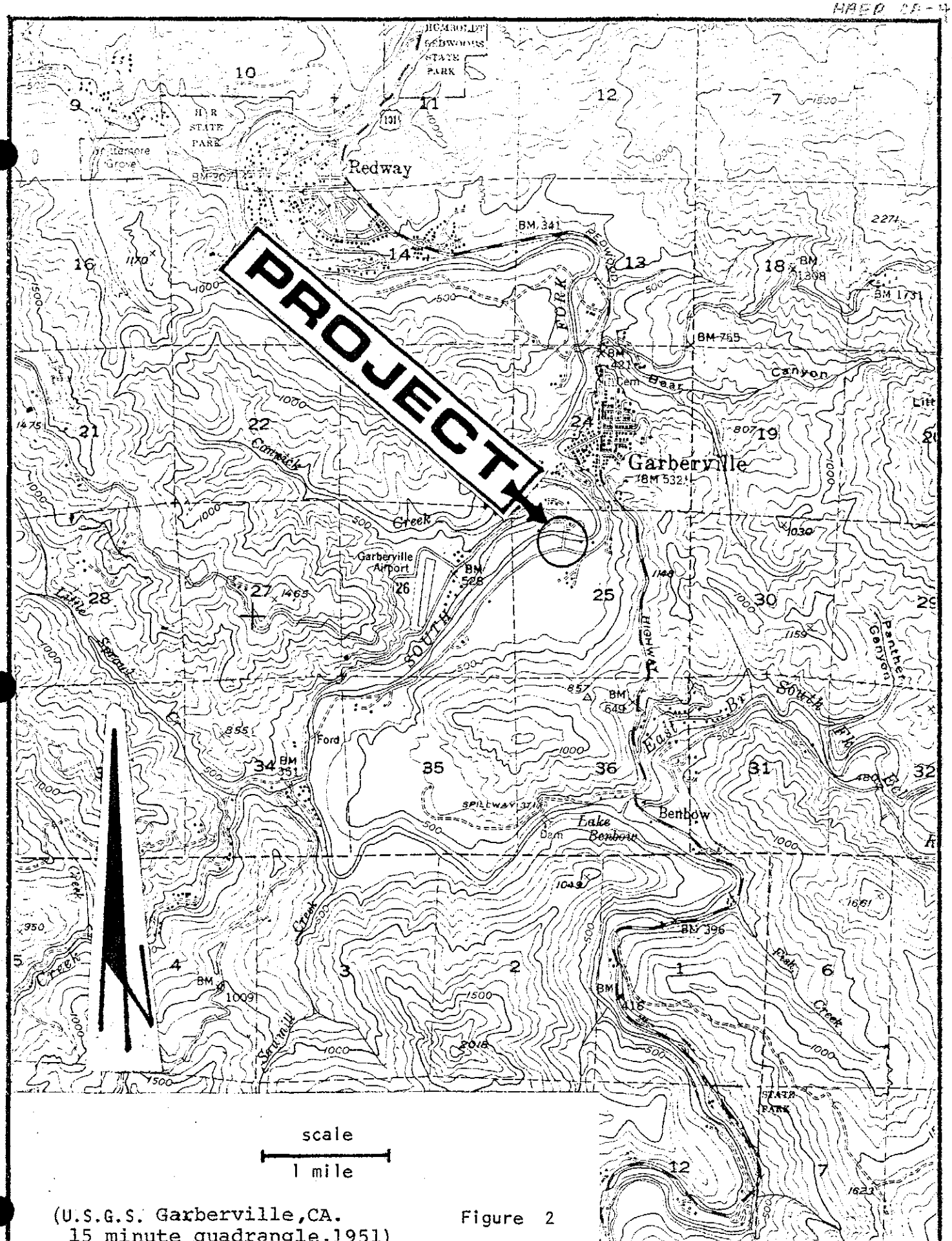
COUNTY MAP



(U.S.G.S. Garberville,CA. 15 minute quadrangle 1951)

Figure 2

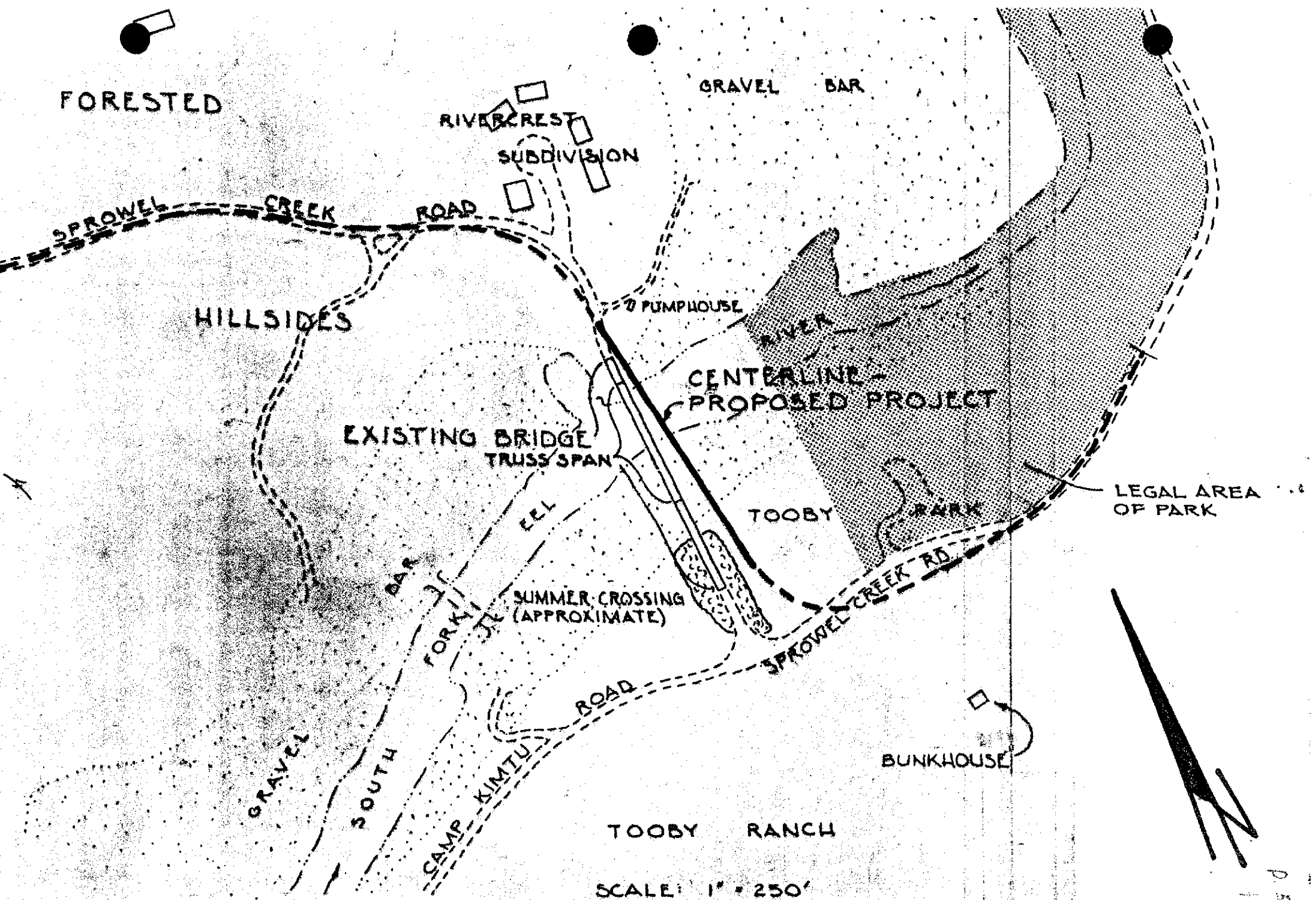
REGIONAL MAP

Moody Bridge spans the South Fork Eel River at Sprowel Creek Road near Garberville, California (Figure 3). From the time this region was settled by pioneers in the mid-1800's, the river was crossed at this location, either by fording or by means of a ferry (TerraScan, 1976). All of the place names at this site are derived from the early settlers. The Moody family were the first white settlers of record on the land immediately adjacent to the bridge site, later selling it to the Tooby family, the present owners (D. Raffaelli, 1979). Tooby Memorial Park, the county-leased facility near the south approach to the bridge, bears the Tooby name as a condition of the lease (Humboldt County, 1967). Sprowel Creek Road was named for the Sproul brothers who were also early settlers in the region. The original spelling is still retained for the creek of the same name on some maps (M. Cook, 1979).

The construction of Moody Bridge in 1908 completed the road connection between the Garberville area and points west of the river, Briceland, Thorn, and Shelter Cove on the coast. This was an important shipping point for Southern Humboldt County. Goods were transported to and from Shelter Cove by mule trains, pack horses, and horsedrawn wagons (Fountain, 33:326).

The bridge was designed by R.L. Thomas for Humboldt County (Humboldt County, 1944) and the original plans bear the name of G.W. Connors, County Surveyor (Moody Bridge Photo 25). It is a Parker, pin-connected through truss design. The Parker truss is a variation of the Pratt configuration, employing a polygonal top chord making the Parker stronger than the Pratt, while requiring the same amount of material. A through truss bridge carries its load level with the bottom chords.

The basic Pratt truss, designed by Thomas and Caleb Pratt and patented in 1844, is distinguished by diagonal tension members and vertical compression members, reducing the length of the compression members to keep them from bending or buckling. The Parker truss members are not as uniform in size as those in a Pratt, which often made the Parker style more expensive to construct (T. Comp and D. Jackson, 1977).



PROJECT SITE MAP | 3

The metal truss bridge was the most common type built in America between 1850 and 1925. At present, there are only four remaining Parker pin-connected, through truss bridges in California, including Moody Bridge; undoubtedly, many of these bridges were replaced through the years due to their narrow width and timber decking, making them inadequate for modern traffic loads.

On August 13, 1906, a man named Washington Connick appeared before the Humboldt County Board of Supervisors at their regular meeting and presented a petition asking that "a highway bridge be built across the South Fork of the Eel River near where the County road leading from Garberville to Briceland crosses said stream". The matter was "taken under advisement" (Minutes of the Humboldt County Board of Supervisors, 1906). The Minutes for March 11, 1908 state: "It is ordered that the County Surveyor be directed to prepare plans and specifications for a steel highway bridge across the South Fork of the Eel River at Garberville" (Minutes, 1908). Two months later, on May 12th, the Board took the following action: "The County Surveyor having submitted plans and specifications for a steel highway bridge over the South Fork of the Eel River at Garberville, it is ordered that said plans and specifications be adopted and that the Clerk advertise for bids for constructing said bridge, said bids to be received up to Wednesday, July 8, 1908, at 10 o'clock a.m." (Minutes, 1908). Then on July 8th: "This being the time set for opening bids for the construction of a steel highway bridge over the South Fork of the Eel River, near Garberville, the following bids were received, opened and read" - a list of eleven bids follows, ranging from $12,174 to $16,820 (Moody Bridge Photo 25) - "It appearing that the bid of Charles G. Sheely is the lowest and best bid, upon motion . . . it is orderd that said bid be, and the same is hereby accepted, and that said Charles G. Sheely be awarded the contract to construct said bridge upon filing with the Clerk a good and sufficient bond in the sum of $12,174.00 for the faithful performance of said contract, and a good and sufficient bond in the sum of $6,087.00 for the protection of material, men and labor." And in the next paragraph: "By consent of the contractor, Charles G. Sheely, and upon motion . . . it is ordered that the cylinder

pier for the south end of said bridge, as specified in the plans and specifications, be changed to a solid concrete pier, as per sketch on file in the Clerk's office, the consideration for said change being an additional sum of $800.00 to the contract price for constructing said bridge" (Minutes, 1908).

Four months later, some progress had been made: "The County Surveyor filed a report at this time stating that material to the value of $2,200.00 has been delivered at the bridge site, and that labor has been done upon said bridge to the value of $200.00, and that under the terms of the contract the contractor is entitled to 75% of the amount of the estimate, or $1,800.00. Upon motion . . . it is ordered that said report be accepted and placed on file, and that the Auditor be directed to draw a warrant for the said sum of $1,800.00 on the County General Fund in favor of Charles G. Sheely, the contractor" (Minutes, November 12, 1908).

Much of the foundation work was accomplished in the next two months, as evidenced by the next Board action: "The County Surveyor filed a report on the contract of C.G. Sheely to construct said bridge in which he estimates the value of the work done upon the structure as being $5,200.00, and recommends that the contractor be paid 75% of that amount less amounts already paid. Upon motion . . . it is ordered that said report be accepted and placed on file, and that the Auditor be directed to draw a warrant for $2,100.00 . . . in accordance with said report and in pursuance of the contract to construct said bridge." (Minutes, January 14, 1909). Work must have progressed steadily on the bridge over the next eight months: "The County Surveyor filed a report at this time stating that material had been furnished for said bridge and labor performed thereon to the amount of $12,000.00; and said report recommends that the contractor be paid $5,100.00, the said sum being 75% of said $12,000.00, less amounts heretofore paid said contractor" (Minutes, September 14, 1909). The bridge was completed sometime that fall, and the final reference to its construction appears in the Minutes for the March 16, 1910 Board meeting: "On motion . . . it is ordered

that the County Auditor draw a warrant for $3,974.00 on the County General Fund, in favor of C.G. Sheely or his assignees, the said sum being full payment . . . for constructing said bridge." (Minutes, 1910).

The original plans for Moody Bridge (Moody Bridge Photo 25) shows that the metal truss center span is 266 feet long, with a roadway clear width of 16 feet. The bridge consists of 14 truss panels (numbered from south to north for description purposes) in the web, each 19 feet long. The central height of the bridge is 40 feet from lower to top chord, gradually descending to 22 feet in height at the hip verticals.

The inclined end posts form a 50° angle with the corner pin connections (Moody Bridge Photo 6). There are six top-to-lower-chord vertical compression members (at the northern termini of the even-numbered panels). The vertical members between panels 3 and 4 (Moody Bridge Photo 8), 5 and 6 (Moody Bridge Photo 9), 9 and 10 (Moody Bridge Photo 11), and 11 and 12 respectively are reinforced with sub-struts and sub-ties; horizontal compression members reinforce the verticals between panels 5, 7, 8 and 10 (Moody Bridge Photos 9, 10, 11). (Other detailed views of pin and riveted connections can be found in Moody Bridge Photos 5, ~~13~~ 12, ~~14~~ 13, ~~15~~ 14 and ~~16~~ 15). The portal bracing consists of a 54" laced channel abutting the portal strut, subtended by corner diagonal bracings at the inclined end posts (Moody Bridge Photos 2, 3, 4, 6, 7, ~~18~~ 16 and ~~19~~ 17). The top and bottom lateral systems are uniformly laced with two diagonal tension members per panel (Moody Bridge Photos 1, 3, 7 and ~~18~~ 16).

The decking of Moody Bridge is made of timber floor beams (Moody Bridge Photo ~~18~~ 16) and stringers (Moody Bridge Photo 1), with a wooden railing extending the length of the center span, at an original height of about 4.5 feet above the deck level (Moody Bridge Photos 1, 2, 3, 7, ~~18~~ 16, ~~19~~ 17 and ~~21~~ 19). The south pier, originally designed to be a 35.5 feet high cylinder, was changed to a concrete pier configuration (Moody Bridge Photo ~~21~~ 19) two months after the plans were drawn (as quoted above from the July 8, 1908 Minutes of the Board of Supervisors). The support structure under the south approach is shown on the original plan as "half

of Redwood tree drift bolted to caps," supported by five wooden piles between 4-in. horizontal planks descending from the pier to ground level at an angle of 20°. The plan also calls for a "mattress of brush weighted with large rock to extend around sheer and pier" (Moody Bridge Photo 25 E).

The original southern approach was curved (R= 114.71 feet) and supported by wooden posts placed at 19 feet intervals, with sway bracing. It was 228 feet long, with a 6% grade, and a flooring of 3 inch pine planks over pine bents (Moody Bridge Photo 25 E). The northern concrete pier (Moody Bridge Photo 18 20), which sits on solid rock, was 17 feet high, with a base diameter of 5.5 feet (Moody Bridge Photo 22 B and 25 E). The approach road at this end of the bridge was only 35.5 feet long, at a 5% grade, of similar pine plank construction (Moody Bridge Photo 23 C and 25 E).

The plans further specified that, "metal intrusses to be medium steel. Counters, laterals and rivets soft steel. All materials and workmanship to conform to the Bridge Builders Standard Specifications. All metal and railings to receive two coats of approved metalic paint. All materials to be first class and work to be done in a thorough and workmanlike manner and to the satisfaction of the Engineer." Bridge dimensions, static and moving loads, a compression formula, and a list of all bids received for construction of the bridge are also given on the original plan (Moody Bridge Photo 25 E).

Besides providing the needed road connection, Moody Bridge played a larger part in the lives of the local residents. Children often attached long ropes to some part of the bridge's understructure and swung out over the river, dropping into the "swimming hole" at the bend. This was also the site of many baptisms in the region when the "circuit pastor" visited the area (M. Cook, 1979).

Through the years, Moody Bridge was damaged by three severe floods. During the 1937 flood, the original southern approach was destroyed and replaced with an approach of a larger radius (Moody Bridge Photo 23 C).

The small steel truss span at the north end of the original southern approach was also removed. The July 30, 1938, Minutes of the Board of Supervisors state that a contract of $5,675 was awarded to H.A. Anderson for the needed repair work (Minutes, 1938).

The southern approach was destroyed again in the December, 1955 flood, and was replaced with log stringer spans on log crib piers (W. Lagenbach, 1973). In 1960, the County removed these logs and replaced them with two 68.5 feet steel stringer and concrete deck spans (Moody Bridge Photo 21 and 26). In the December of 1964 flood, water rose to above the deck elevation, washing out the earthen embankment at the southern end and damaging some of the bents in the northern approach, as well as severely damaging vertical posts and lower truss members. The north center upstream post received major damage displacing it two feet from its original position. The earth embankment was replaced as a temporary measure and later reinforced with rock riprap. Temporary posts were also placed next to the damaged ones and several tension members were reinforced (Humboldt County, 1965). The truss span and northern approach were also redecked at this time. Actual costs of the repairs following the 1955 and 1964 floods are not recorded in the Board Minutes, as they were included in County-wide disaster relief funds.

Over the years, the following original structure components were replaced: the north and south timber approach spans; the small steel truss span at the north end of the southern approach; all of the timber stringers and deck planks; and several of the horizontal, vertical and diagonal tension members. The only original section remaining is the steel through-truss span.

The following is a description of changed or altered, but existing, Moody Bridge dimensions and specifications from the 1973 Bridge Report by W. Langenbach. The Report reflected some of the changes in Moody Bridge's dimensions resulting from numerous repairs required since its original construction.

Southerly Approach Spans: Two spans composed of steel girders with a reinforced concrete deck.

Northerly Approach Spans: Three spans composed of timber stringers and deck.

Vertical Clearance: 15' 10" above the surface of runner planks within the central 8' of roadway width.

Horizontal Clearance: Limited to 16.0' between the steel truss end posts above the timber railing.

Curbs: Southerly approach spans: none.
Truss and northerly approach spans: 8" x 8" redwood on timber scuppers. The top of the curb is 11" above the grade of the top of runner planks.

Surfacing: none.

Deck: Southerly approach spans: reinforced concrete. Truss and northerly approach spans: runners - two wheel lanes spaced 5' 2" composed of 4 each 12" x 3" mixed redwood and Douglas fir in each lane; tranverse - 12" x 2 1/2" redwood spaced at about 12 1/2" centers.

Stringers: Southerly approach spans: 3 lines of steel stringers spaced at 5' 6" centers. Truss span and northerly approach spans: 13 lines of 4 1/4" x 15 1/2" redwood at 15" ± centers.

Roadway Width: 13.8' minimum between faces of curbs on the truss and northerly approach spans and 15.3' face to face of railing on the southerly approach spans. Above the railing, the width is limited to a minimum of 16.1' measured between the truss end posts of the steel truss span.

Railings: Southerly approach spans: Steel Flex-Beam on steel posts. The distance face to face of the railing is 15.4'. The top of the railing is a maximum of 3' 11" above the runner planks.

The report also revealed serious structural damage to the bridge, including split stringers and deck runners, possible decay in the transverse planks, and structural damage from vehicular impacts on the bridge. Moody Bridge Photo 24/~~8~~, of truss repair plans, was included in the Bridge Report.

When constructed, this single lane bridge was capable of supporting the legal weight loads, since the traffic was composed of horse-drawn wagons, pack mules, and stock. A 1944 photograph (Moody Bridge Photo 22/~~8~~) shows the following sign suspended from the portal strut: "Do not cross with more than one heavily loaded truck or wagon at a time - Do not travel faster than a walk with team or loose stock. Order of Supervisors" (Humboldt County, 1944). In 1969, the posted weight limit for Moody Bridge was 28 tons per semi-trailer combination, and stipulated one truck or bus on the bridge at a time and a speed limit of 10 mph for vehicles over 10 tons (Humboldt County, 1969). In 1979, Moody Bridge was the only posted bridge on a major route in Humboldt County, with a 20 ton limit for single vehicles, 31 tons for combinations, 10 mph for vehicles over 10 tons, and only one rig allowed on the bridge at one time (D. Raffaelli, 1979). These load limits, along with the narrow width of the bridge and restrictive height of the overhead truss, made Moody Bridge legally inadequate per the California State Highway and Vehicle Codes.

Moody Bridge will be replaced in the summer of 1980.

Due to the historical significance of Moody Bridge and potential value the bridge has to scholars, historians, engineers and the public, this report has been prepared to record the bridge to the standards of the Historical American Engineering Record (HAER).

This HAER report complies with the Memorandum of Agreement (MOA) executed by the Advisory Council on Historic Preservation in November 1979,

pursuant to Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Section 470f, as amended, 90 Stat. 1320 and Section 800 4 (d) of the regulations of the Advisory Council on Historic Preservation (Council), "Protection of Historic and Cultural Properties" (36 CFR Part 800)).